

Does Your Patient Need

Cardiac Surgery?

What to Expect Before and After

Patients who are facing some form of cardiac surgery need to understand the risks and benefits involved. Some procedures can prolong life without many complications, while others have mortality rates as high as 25%.

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Case

Mr. X, who just had cardiac surgery three weeks ago, visits his family physician complaining of fever. The following issues were addressed:

1. Was the surgical procedure a coronary bypass surgery, a valve surgery, or both?
2. If the fever is related to the surgery, is it endocarditis, infection of surgical wound sites, or infection of the lungs or urinary tract?
3. If it is endocarditis, is it an infection of the native valves or the replaced prosthetic valves?
4. If it is infection of the surgical site wound infection, is it sternum site or conduit site infection?

Physical examinations include:

1. *Cardiac*: Note changes in heart sounds. Detection of murmur may indicate valve dysfunction.
2. *Respiratory*: Detect any foreign sounds or decreased air entry.
3. *Local surgical wound site examination*: Verify sternum incision site—is it tender on palpation? Red and inflamed? Stable or mobile? Is the wound draining pus or serous fluid? Verify the conduit harvest sites for similar signs.

For more on what needs to be done post-physical exams, see the case discussion on page 35.

In this article:

1. What is the role of the family physician?
2. What are the possible outcomes involved with different cardiac surgeries?

Cardiovascular disease remains one of the most common causes of death in Canada; it is related to 36% of all deaths. The practicing physician encounters a significant number of patients with heart disease, including those who have, or will undergo, cardiac surgery. An overview of the common cardiac surgical procedures is provided below.

Coronary artery bypass grafting

Coronary artery bypass is the most common cardiac, surgical, open-heart procedure performed. It is indicated for coronary artery disease associated with symptoms and/or significant lesions in coronary arteries.

The operation entails bypassing the stenosed artery using conduits, such as the internal mammary artery, segments of saphenous veins and/or the radial artery. Artificial conduits are not successful due to the small size of coronary arteries.

Outcomes. The surgical mortality for elective cases is < 1%. Overall mortality for all types of cases is approximately 2.5%.



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Table 1

Surgical mortality due to valve replacement

Type of surgery	Mortality rate
Aortic valve replacement	1%
Mitral valve replacement	1.5%
Combined mitral and aortic valves	4.5%
Valves and bypass grafting combined	4.5% to 5%

University of Alberta statistics, Edmonton, 2001.

The procedure provides relief of angina in a large majority of patients and reduces the chance of future myocardial infarction (MI). Coronary artery bypass also improves longevity of life in selected subgroups.

Valvular heart surgery

This surgery is usually performed for the aortic and mitral valves and, at times, for the tricuspid valves. The procedure can involve repair or replacement of the valve. Repair is generally performed for the tricuspid and the mitral valves and, occasionally, for the aortic valve. The replacement of the valves can be undertaken with a tissue valve or a mechanical valve. Tissue valves do not require long-term anticoagulation, but may need to be replaced after 10 to 15 years. Mechanical valves require lifelong anticoagulation, but have significantly longer durability. Table 1 shows the surgical mortality rate of valvular replacement.

Outcomes. Valvular surgery provides significant symptomatic relief with improvement of shortness of breath and exercise capability. It also prolongs life.

Table 2

Surgical mortality of thoracic aortic surgery

Type of surgery	Mortality rate
Acute aortic dissection	12% to 25%
Elective aneurysm repair	2% to 4%

Bavaria JE, Brinster DR, Gorman RC, et al: Advances in the treatment of acute type A dissection. *Ann Thorac Surg* 2002; 74(5):S1848-52.

Table 3

Postoperative wound complications after surgery

Complication	Occurrence rate
Superficial wound infection	5%
Deep sternal wound infection*	0.25% to 1%

* If this is associated with an unstable sternum, it requires urgent surgical debridement and rewiring.

Baskett RJ, MacDougall CE, Ross DB: Is mediastinitis a preventable complication? *Ann Thorac Surg* 1999; 67(2):462-5.

Surgery of the thoracic aorta

Thoracic aortic surgery is usually carried out to replace a segment of diseased aorta, either due to trauma or the development of an aneurysm. Dissection of the aorta (either acute or chronic), around the ascending and/or arch of the aorta, requires surgery. Table 2 shows surgical mortality rates associated with surgery of the thoracic aorta.

This operation provides a significantly longer life in patients who are at risk of rupture and sudden death.

Possible complications. Patients who are hypertensive need to have active control of their blood pressure postoperatively. In patients with dissecting aneurysms, there is a risk of subsequent dissection in the remaining aortic segment. A careful six-month or annual followup with a computed tomography scan is required.

Cardiac transplantation

Replacement of the heart with an allograft can be performed for end-stage heart disease where no other form of therapy is available. Due to the shortage of donor organs, careful recipient selection is needed.

Outcomes. The surgical mortality of cardiac transplant is 5%. The one-year survival rate is currently 90% and most hearts last approximately 11 years. An accelerated form of coronary atherosclerosis limits long-term success.

The procedure requires careful followup, anti-rejection medications, and control of infection. Cardiac transplantation increases life expectancy and functional ability. The majority of patients will eventually return to an active life.

Surgery for congenital heart disease

Most surgery for congenital heart problems is done in neonates or children. Occasionally, adults with undetected atrial septal defect or coarctation of the aorta require correction.

Outcomes. The current results of these complex problems are very encouraging. The overall mortality is 2.5%. Outcomes vary with the complexity of the original pathology.

Preoperative management

Patients who are scheduled for a surgery that is not urgent have a preoperative waiting peri-

od. During this time, attention needs to be paid to psychological support and smoking cessation. Any change in the symptomatology should be conveyed to the treating physicians, as it may require hospital admission or an upgrading of the surgery.


The postoperative complications involved with surgery are listed in Table 3.

Outcomes. Incidences of postoperative MI, stroke, renal failure, and pleural effusion range between 1% and 2%.

Generally, it takes two to three months for total recovery and return to work. Patients will have some degree of incisional chest discomfort. Some patients experience neurocognitive dysfunction for a temporary period. Reoccurrence of angina or significant heart failure needs re-evaluation by a cardiologist.

Getting the full picture

Family practitioners have an important role in the management of patients with cardiovascular disease. If surgery is necessary, an overview of the various procedures should

help in the patient's understanding of the related problems and benefits. 

References available upon request—contact *Perspectives in Cardiology* at cardio@sta.ca.

Take-home message

- Coronary artery grafting is the most common cardiac surgery and the mortality rate is < 1%.
- In valvular replacement surgery, mechanical valves have longer durability than tissue valves, but require long-term anticoagulation.
- Thoracic aortic surgery can prolong life in patients at risk of rupture or sudden death, but mortality rates can reach 25%.
- For cardiac transplantation, the one-year survival rate is 90%; mortality rate is 5%.
- Surgery for heart disease can include postoperative complications, such as superficial wound infection and deep sternal wound infection.

The case of Mr. X

So, what should you do after the physical examination?

- Perform a complete blood count with differentials.
- Do blood cultures for suspected endocarditis prior to antibiotic administration and refer patient to hospital for further management immediately.
- Do wound swabs for culture and antibiotics if it is a superficial infection.
- In case of a deep wound infection of the sternum, patients should be referred to hospital for further investigations (*i.e.*, computed tomography scan, bone scan, white cell scan) and management.
- If the sternum is unstable, even without external signs of infection, the patient should be referred back to the hospital for further management.
- Most of the vein harvest site infections can be managed by proper antibiotics.
- Perform X-ray chest to rule out pneumonia or pleural effusion. For large size effusions, or if breathing is compromised, refer patient for drainage.
- Urine microscopy and culture can be done and, if positive for infection, treat with appropriate antibiotics.

